Public Engagement with CCS: A Different Perspective.
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Cover photo: c/o Chris Jones

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Foreword

Carbon dioxide capture and storage (CCS) is anticipated to play an integral role in reducing carbon dioxide emissions in a number of countries, including the UK. There has been substantial investment in the technology by governments and industry worldwide. However, despite a growing awareness of the threats posed by climate change, CCS remains a relatively unknown and poorly understood technology among publics. This is problematic as experience from previous failed technology transfer efforts (e.g. GM food) suggest that public acceptance of CCS will be integral to its successful deployment.

What constitutes well-timed, well-placed and appropriate communication around CCS is, as yet, unclear. Although there is previous research into public engagement with and public perception of CCS, little is known about social, psychological, linguistic and geographic factors impacting on these processes. A workshop was held in May 2012 with the objective of starting to define a research agenda to understand these factors and the impact they have on public perception. The workshop brought together representatives from industry, NGO and government and academics to discuss the key social issues surrounding the development and deployment of CCS projects in the UK. The primary outcomes of this timely workshop are presented in this report.

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and political contexts in which metaphors and other framing devices are used in the public, policy and scientific debates about emerging technologies, emerging diseases, as well as climate change. She has written books and articles on the history of linguistics, semantic change, metaphor, metonymy, polysemy and, more recently, the sociology of health and illness and the social study of science and technology. In 2011 the University of Nottingham awarded her a DLitt for her research and publications relating to the social study of metaphor. She is a Member of the Academy of Social Sciences.

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Peter Styring is Professor of Chemical Engineering & Chemistry and Chair of Public Engagement at the University of Sheffield. He is Chair of the CO2Chem Grand Challenge Network (www.co2chem.com) that is looking to augment carbon capture and storage with additional utilisation capabilities. His current research is in new capture agents for CO2 and catalysts for its conversion to value added chemicals such as synthetic liquid fuels. His research is primarily funded by EPSRC and FP7 in collaboration with a number of international companies. He has also presented TV and radio shows on science and engineering and produced new media documentaries.

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1. Introduction

Public understanding of Carbon Capture and Storage (CCS) in the UK is, at present, perceived to be low, with similarly low levels of understanding across much of Europe. This lack of understanding could pose problems when CCS facilities are proposed or introduced into communities and can be a barrier to potential widespread deployment of the technology in the future.

Thus, an understanding of public debates about CCS is essential and in particular to gain insights into what factors (psychological, political, cultural, social) may motivate people to accept or reject this technology. Local and global deployment of CCS can only happen in an atmosphere of trust based on mutual understanding between all stakeholders.

In order to gain deeper insights into these issues, the Nottingham Centre for Carbon Capture and Storage (NCCCS; a collaboration between the British Geological Survey and the University of Nottingham), and the University of Sheffield, co-organised a workshop to discuss the importance of developing effective public engagement and communication strategies around CCS. Unlike other such activities which have happened around the world, the focus here was on studying psychological and cultural factors, including linguistic ones, as well as learning from previous controversies.

The workshop was attended by delegates from industry, academia, NGOs and other interested parties in order to discuss some of the issues involved in communicating CCS to the public, and also to consider how lessons could be learned from previous attempts to communicate science and technological issues to the public.

The workshop did not aim to agree a consensus position amongst all attendees; rather it was designed to encourage discussion and debate of some of the key issues and to explore potential future areas of research to understand why the public reacts in certain ways to certain issues, and how messages can be communicated.

This workshop report provides an outline of the issues discussed and includes a summary of most of the presentations discussed on the day. The concluding summary attempts to draw together the main themes of the presentations and discussions and suggests options for future work. It does not necessarily represent the opinion of any or all of the co-authors, nor of all of the delegates present.

Dr. Christopher Jones, Antony Benham & Prof. Brigitte Nerlich
2. Summaries of main presentations

2.1 Factors that influence public opinion of CCS

Christopher Jones and Claire Lawrence

A principal reliance on fossil fuels for electric power generation conflicts with pressures to reduce anthropogenic GHG emissions. This has promoted research and development into Carbon Capture and Storage (CCS), which is anticipated to play a key role in reducing such emissions from this sector (World Resources Institute, 2010). However, the unfamiliarity of the technology, anticipated economic costs and perceived risks mean that public acceptability of the technology cannot be guaranteed (Sharp, Jaccard & Keith, 2009). As such, forging a better understanding of public opinion to the technology and engaging in appropriate public outreach and education will be key to the success of CCS projects.

What do we know about public opinion?

Awareness of CCS and its applications is typically low (Malone, Dooley & Bradbury, 2010) and general attitudes are typically characterized by ambivalence as people trade of the benefits in terms of mitigating climate change with subjective perceived risks (e.g., fears of leakage or explosion leading to threats to human health) (e.g., Bradbury, et al., 2009; Tokushige, et al., 2007). For a list of commonly perceived benefits and risks, see Table 1.

This ambivalence is often viewed negatively by proponents of CCS, stemming perhaps from a fear that bad-press or miscommunication could lead attitudes to crystallize in a negative direction (World Resources Institute, 2010). Arguably, however, this ambivalence should be viewed positively, as an opportunity to inform and improve opinion while it is still forming.

Central to this effort will be developing proactive programmes of public outreach and engagement (World Resources Institute, 2010); however, this will be a no mean feat due to the inherent diversity of the public and public opinion.

Opinion within Affected Communities

It is important to consider the location of those being engaged with. The findings of research into public attitudes towards other power-generating facilities (e.g., wind farms) clearly illustrates how the attitudes of the general population can differ from those living in affected communities (i.e., close to proposed development) (e.g., Jones & Eiser, 2009).

In some instances a person’s resistance to development appears confined to the local context, which has given rise to the term Not in My Backyard (NIMBY). NIMBY is often used as a catchall description of local opposition; however, research has called into question this ubiquitous use.
Table 1: Common perceived concerns and benefits of CCS

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Concerns</th>
</tr>
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<tbody>
<tr>
<td>A bridge to a low-carbon future</td>
<td>Safety risks related to a CO2 leak</td>
</tr>
<tr>
<td>Could avoid release of large quantities of CO2 into the atmosphere</td>
<td>The risk of ground water contamination</td>
</tr>
<tr>
<td>Allows for the continued use of fossil fuels</td>
<td>Harm to flora and fauna near storage sites</td>
</tr>
<tr>
<td>Should enhance energy security</td>
<td>Possible explosion of CO2</td>
</tr>
<tr>
<td>Helps to clean up coal-fired power plants in developing countries that require energy</td>
<td>Wrong solution to climate change</td>
</tr>
<tr>
<td>Allows reduction of emissions without necessitating much change to lifestyle</td>
<td>Low availability of storage sites, CCS technology and infrastructure</td>
</tr>
</tbody>
</table>

Adapted from Ashworth et al. (2010)

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<tbody>
<tr>
<td>Long term viability and economic cost of technology</td>
<td>Scale required for mitigation of CO2</td>
</tr>
<tr>
<td>Unknown technology</td>
<td>Could draw funding from renewables</td>
</tr>
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</table>

NIMBY actually refers to a specific form of opposition, whereby a person has a favourable general attitude towards a facility (‘I like CCS…’), but resists it locally due to reasons of ignorance or self-interest (‘…just not here as it may lower my house price’). While NIMBYism can perhaps account for some local opposition, a growing literature attests to a number of other reasons for such opposition (e.g., Devine-Wright, 2005; Wolsink, 2007).

For instance, while people might logically have concerns with the technology or facility in question, there are a number of other external (situational) and internal (dispositional) factors that are likely to influence opinion (e.g., Devine-Wright, 2009). The following discussion details how issues of trust, place protective action and personality might influence opinion to proposed CCS facilities.

**The Importance of Trust**

Trust in developers (and acceptance of development) has been found to relate to planning strategies. Top-down, exclusive forms of development (i.e., where developers make the important decisions about proposed schemes before announcing them) have been found to undermine trust in developers, resulting in opposition. Conversely, inclusive forms of planning (i.e., where developers fully engage and deliberate with affected communities) tend to enhance perceptions of procedural justice and reduce opposition (Walker, 2009). Thus, participatory planning should be considered when considering future CCS projects.
Place Protective Action

People can form positive ties to place and research demonstrates how disruptions or threats to these ties may result in protective responses (e.g., protesting) (see Devine-Wright, 2009; Devine-Wright & Howes, 2010). What is interesting in the case of retrofit CCS in particular is that, compared to construction of new power plants, this technology should promote the continuation of fossil-fuel electric power generation in communities with an existing reliance on this industry. As such, proposed CCS development could facilitate rather than threaten ties to ‘place’, thus garnering support for such development. Support for this hypothesis emerged in a recent study (Jones & Scott, 2012) where despite perceived risks, attitudes to CCS in communities with strong affiliations to coal-fired power generation were generally favourable.

Personality

Evidence suggests that the public increasingly blame environmental features for their non-specific symptoms (NSS) and malaise when medicine cannot offer satisfactory explanations (Page, et al., 2006). For example, individuals may attribute symptoms of ill-health to the presence of a nearby mobile phone mast or radio transmitter (Petrie, et al., 2001). Similarly, increases in perceptions of ill-health at a time when general health is improving demonstrate that other, potentially psychological, factors may be behind people’s propensity to report feeling unwell. Concerns about invisible environmental agents (e.g., emissions from new technologies) appear to act as a trigger for such reports of ill health (Petrie, et al., 2001). Issues relating to CCS may well fall into these categories.

Recently, for example, wind turbines have been suggested as a culprit in the search for explanations of NSS (Wind Turbine Syndrome: Pierpont, 2009). While psychological distress and specific environmental stressors (e.g., McMahan & Meyer, 1995) have been shown to increase symptom reporting, individual differences in negative oriented personality (NOP) traits (e.g. Neuroticism and Intolerance) may also be an exacerbating factor (Ferguson, et al., 2006). In a recent study (Taylor, et al., in press), these traits strengthened the association between perception of noise from wind turbines and reported ill-health. This is despite the fact that there was no association between actual noise from the turbines and ill-health.

Conclusion

In order to promote acceptance of CCS developments (or lessen opposition) engagement and communication activities around CCS need to incorporate the following:

1. Considered engagement and inclusion of communities at all stages of development. Such activity should not only stand to increase the understanding of any specific concerns or desires of host communities but could also stand to promote trust in the developer and general acceptance of the development;
2. Where possible an explicit linking of CCS developments to positive place identities – showing the positive effects of the development on local communities, e.g., in terms of job protection;

3. High quality communications and message framing of information about CCS closely tied to with personality traits known to have more significant anxiety about such developments. While the outlined research might lead to a belief that personality factors may make it impossible to tailor any communication about new technology to individual personality traits, the existing research suggests that this is not the case;

4. In relation to (3), the quality of the communicative message is also vital. Evidence suggests that high quality messages promote the anxiety reduction aspects of a development, whereas lower quality communications can serve to hijack this process.

2.2 Predicting CCS Attitudes: Costs, Timeframes and Efficacy

David Clarke and Andrey Barsky

Our research is investigating the factors that determine perceptions of CCS by the public, and whether these may be useful in predicting acceptance of – and opposition to – CCS in the future. We explored the interaction of various technical factors in a ‘vignette’ study. Participants were shown a brief description of CCS, which systematically varied the numeric values of cost, timeframe, and efficacy in reducing emissions. This was a 2x2x2 design, where each factor had one of two possible values – each participant saw a particular version of CCS that was more or less costly, more or less prompt, and more or less effective. Afterwards, they completed a questionnaire designed to elicit their opinions on the topic.

Although the vignette manipulations had little effect on participants’ perceptions of CCS on the whole, there were some interesting exceptions. When CCS was presented as a higher-cost solution, participants were significantly less likely to consider themselves well-informed about it. A possible interpretation of this effect is that participants are more cautious about professing understanding of topics that are more important or have higher stakes, and the cost of CCS is a proxy for this quality. We also found an interaction between cost and timeframe in participants’ preference for renewables over CCS. Renewables were more attractive when CCS took a long time to implement, but only when CCS was relatively cheap – this relationship reversed when CCS was presented as more expensive.

A second study is in progress to investigate the effects of more substantive manipulations – using a vignette similar to the first, but with whole paragraphs of description added or omitted in different conditions. Participants are presented with a short article which discusses the benefits, costs and past applications of CCS technology, in different counterbalanced configurations. We are interested in how different types of information affect participants’
judgements, and also in how intuitive these effects are. To that end, the experiment also asks participants to put themselves in other conditions, and imagine having read a different text. This way, data are gathered that tell us about what participants think, and what they think they would think in different circumstances, and the two can be compared.

Data collection is continuing, but preliminary analysis suggests that participants overestimate the reassuring quality of learning about the benefits of CCS, given the difference between predicted and reported scores on questions like “I think CCS will have negative consequences for the environment”. This has implications for public engagement, as it suggests that learning about why CCS is necessary is less effective than it intuitively appears. This effect may reflect how information about the benefits of CCS activates concepts associated with the fragility of the environment, and makes people less inclined to judge a potentially 'risky' technology like CCS as worthwhile.

A third study is planned, using judgements from CCS experts to formulate a conceptual map of possible pathways to success and failure. Experts, with their knowledge and intuition, can independently attempt to predict the best-case and worst-case scenarios for CCS in the future. The structure of these predictions can be analysed sequentially and aggregated to gain an idea of where the scenarios diverge, and where particular efforts should be deployed.

2.3 China and CCS

May Tan-Mullins

Climate change communication (CCC) and carbon capture and storage (CCS) are emerging critical issues for China. Indeed, coal provides 72 percent of China’s electricity which makes the nation the world’s largest producer of carbon dioxide. To counteract this trend, China has been progressive in terms of strategies to mitigate the consequences of heavy coal use. For example, the Promoting Clean Production Act and the Air Pollution Prevention Act were enacted by the government in 2002 and 2004, respectively. The National Committee of Coping with Climate Change and Energy Saving was also formed in 2007. More interestingly, the Chinese government released a White Paper on ‘Strategy and Action: China’s Response to Climate Change’ in 2008. The series of actions on carbon control peaked with the release of Chinese guidelines on ‘Carbon Capture and Utilisation and Sequestration’ on the 26 September 2011. There are also numerous CCS demonstration projects in China such as the Shenhua project based in Ordos and PetroChina in Jilin province, which are currently under construction.
With the state as the main actor on championing CCC and CCS causes, what are the roles of non-state actors such as the media, Non-governmental organizations (NGOs) and the public in China? The main aim of this research is hence to investigate the roles of non-state actors through a scoping study based on 552 online articles and blog pieces (both Mandarin and English mediums) on CCC and CCS dating between the years 2007 and 2012. With the findings in place, this report will also identify future research opportunities and possible avenues of China-UK collaboration. The main findings of this research are:

The main players of CCS and CCUS projects in China are the government, state-linked actors (i.e. State-owned enterprises such as Petro China and Shenhua Coal Enterprises) and industries. Unlike UK and EU counterparts, there is no formal engagement between the state and the public regarding these mitigation strategies. This could be contributed to the fact that energy issues are considered highly sensitive and are regarded as a national security issue. Hence, public participation and discussion are not encouraged. The lack of transparency in the public arena also results in less opposition to the demonstration projects which enables the progression of construction of the CCS and CCUS projects without much protest.

CCS emerged in the Chinese political arena as early as 2005. However, the first mention of CCS in public discourse was only documented in 2008. In one such article, a reporter expressed scepticism of the effectiveness of CCS. Subsequently, in 2009 and 2010 there were only 13 news pieces; six on CCC and seven on CCS respectively for a grand total of 16 news pieces in four years. As such, the question of whether the public understands the concepts of CCS and CCUS, and the possible roles they could play in these projects arises. The lack of media attention also indicates the absence of a media-scientific platform for communication between journalists and scientists regarding difficult concepts such as CCS and CCUS.

In terms of CCS projects, the first media report on participation of non-state actors was the China Environmental NGO Sustainable Development Conference in November 2010. The conference was followed by a series of workshops, forums and launches of initiatives on CCC and CCS organized by universities (i.e. Wuhan University) and NGOs (i.e. World Wildlife Fund). However, participation is still mainly confined to forums of exchange and practical involvement is far and few between.

With the above findings, we conclude that there are several obvious gaps in the discussion of CCS and CCUS in China, which requires further investigation. First, there needs to be an exchange between China and the UK on the institutional framework governing CCS and CCUS. In particular, laws and regulations pertaining to health and safety, and procedures, could be exchanged. In learning from the best practices of the UK, China will be able to progress on its labour and working conditions in coal mines and power plants. Second, China still lags behind in terms of technology and skills in the CCS and CCUS industry. The UK could capitalize on this gap and work together with China to explore new venues for investment. Third, there is a
need to engage the Chinese public on these issues. Although China is able to progress on CCS projects without much public participation (either support or protest), this will change in the future with the public being more educated and well-informed. Hence, it is important to embark on the engagement process proactively instead of reactively. Finally, future research is vital on the topic of geo-engineering risks, especially pertaining to new technologies such as fracking. With a clear understanding of the risks and benefits involved, will the public be able to participate in the promotion of such environmentally friendly projects in the future.

2.4 UK newspaper reporting on CCS in 2011: From hype to disillusionment

**Brigitte Nerlich and Rusi Jaspal**

CCS first made its appearance on the traditional UK media scene in 2004, when six articles appeared in UK newspapers, including one important letter to the *The Independent* (27 May, 2004) entitled “New weapon against global warming”. This letter can be regarded as a starting shot for serious CCS investment, policy support and research (both direct CCS research and research into public perception of CCS) in the UK. Between 2005 and 2009 CCS was increasingly discussed in the UK press but interest has declined in more recent years due to a series of project cancellations and delays in implementing the technology. This article studies a segment of UK press coverage in the year 2011, a year marked by initial glimmers of hope, followed by disappointment. The focus is on two prestige newspapers, a national one (*The Times*) and a regional one (*The Aberdeen Press and Journal*).

Although numerous studies have tried to gain insight into public perception of and attitudes to CCS across the world (Markusson, Shackley & Evar, 2012), mainly using surveys, focus groups and interviews, only relatively little research so far has looked at media coverage of CCS (Mander & Gough, 2006, on UK, US, Australia; Buhr & Hansson, 2011, on Norway and Sweden). This is surprising as the media reflect public perception but also shape it. In our presentation we traced the way that the media agenda around the issue of CCS developed over time, in particular throughout 2011, with a particular focus on the sources quoted in the newspaper and the linguistic choices made to talk about CCS.

We carried out a frame and metaphor analysis (Fisher, 1997) of the coverage of CCS in *The Times* and *The Aberdeen Press and Journal* in 2011. To provide some background we also briefly discussed the 2004 letter which frames CCS as a weapon in the fight against global warming, a framing that continues in 2009 with an added emphasis on CCS’s contribution to a low carbon economy (Nerlich, 2009, 2011).
Figure 1. Media volume relating to CCS, 2004-2011. Based on Nexis®, search term ‘carbon capture’, UK newspapers, moderate similarity setting.

Our analysis of the coverage of CCS in The Times and the Aberdeen Press and Journal revealed that the use of salient positive and negative metaphorical frames is very similar, that there is some overlap in the use of regional and national sources (e.g. Alex Salmond), but that there are also significant differences between the two papers.

Sources

The Times uses far fewer sources and has no critical discussion of CCS, whereas The Aberdeen Press and Journal gives voice to opponents to CCS such Friends of the Earth, for example, and discusses various aspects of CCS critically, such as costs, risks and safety and the dream of job creation.

Framing and timing of framing: In both papers positive and negative frames are mirror images, mainly focusing on winning or losing the race to implement CCS. Positive framing relating to the central ‘race’ metaphor is attested by the use of words such as: race, world lead, lead, leadership, forefront, (global) front-runner, vanguard, pioneering, flag-ship, massive step forward, step in the right direction, spearhead, way ahead, ahead in the race, go ahead, accelerate and pole position. Negative framing is attested by the use of words, such as pulling out, kick in the long grass, collapse, abandon, delay, erratic driving, backsliding and quit. Related to these negative phrases related to losing the race are other negative framings: The war on climate change is replaced by battle scars incurred when trying to win the race with expressions being used such as: serious blow, shock, headache, and blindsided (employed in the context of Scotland losing UK government support for its CCS projects). And finally a number of negative expressions emphasise the fact that CCS doesn’t really ‘sell’ anymore: shelved, pulling [something], and put on the back burner.

The difference between the two papers lies in the timing of these framings. While negative framing creeps into The Times reporting by the beginning of October 2011, The Aberdeen
Press and Journal only flips suddenly to negative framing on 29 November. Throughout the year Scotland’s governing political party tries to hold on to the CCS dream and the vision of job creation, linked to pride in Scotland’s industry and confidence in its workforce, even after Longannet was abandoned. However, by end of November 2011, all seems lost, despite Scotland’s best efforts and Scotland feels abandoned by the UK government.

What lessons can be learned from this analysis, apart from the fact that without investment the ‘race’ to implement CCS can’t be won, neither by a region nor by a nation?

The news agenda around CCS is defined by issues, events, sources and framing. The issue of CCS is its implementation as climate change mitigation option; events are publications of government budgets, investment promises by industry, reports by academics and so on; sources include the voices, actors, or groups featured in news coverage; and framings are linguistic choices that set the tone of the debate and influence political actions and industrial investment. In our case, the voices of government and industry actors were very much in favour of CCS (with only a few voices of reflection and critique appearing in The Aberdeen Press and Journal). From top government pronouncements at the national level down to the regional level implementing CCS was seen as (even hyped as) positive and beneficial and framed as winning an economic and climate change race. This view and the framings of CCS changed under the impact of financial cut-backs, not because actors and stakeholders suddenly changed their minds. The result of this political ‘kicking CCS into the long grass’ will not only be disillusionment and disappointment, but a substantial loss of trust in a government, which may be seen as good at talking the CCS talk (especially adopting the race and leadership frame), but not strong enough to take charge of the issue. On the regional, Scottish, level, pride and confidence have been severely dented, and it will probably be difficult to resurrect such emotions and with them pro-CCS actions.

2.5 How is CCS represented by the media and the public?

Peter Styring

Upham and Roberts at the University of Manchester surveyed the UK, Netherlands, Poland, Germany, Belgium and Spain to determine the public reaction to carbon capture and storage (http://www.communicationnearco2.eu). In general, they found a low base knowledge of CCS, especially the associated technologies. The subject groups were then exposed to the technologies and the aims of CCS as a means of greenhouse gas emission mitigation were explained. The result was that perceptions changed, but not in the ways that were expected. Increased knowledge of CCS led to greater mistrust amongst the sample. CCS was seen as an ‘end-of-pipe’ technology rather than a remediation method. This shows that public
understanding is key to a technology being adopted and accepted: the media plays a hugely important role in dictating and defining public perception.

Studies by the CNRS in France showed that only 6% of those surveyed (age 15+) could define CCS technology, although 59% were in favour of it. The group were then exposed to information, particularly the adverse consequences of CCS. Approval rates fell to 38% through increased knowledge. This shows that approval rates are not anchored, but are heavily influenced by negative information (Ha-Duong, et al., 2011).

In Germany, public perception of CCS has clouded through literal translations. The method of CO2 transportation across vast networks of pipelines is through the transformation of gaseous CO2 to supercritical CO2 (scCO2), or Überkritischen Kohlendioxid. Über translates as over, above, beyond and kritischen as critical, dangerous, serious, etc. Therefore the fluid becomes “beyond dangerous carbon dioxide”!

A review of international press revealed mixed opinion when it came to CCS. In the United States, there is a steady drift from CCS to Carbon Capture and Utilisation (CCU). The New York Times has reported (13 August 2010) that new technology to make ‘green cement’ from CO2 may make CCS obsolete, yet it does not consider the quantities of gas that could be captured, or the volume of cement produced. However, it also reports that the tide is changing against CCS (13 July 2011) with the full-scale capture plant at the Mountaineer coal-powered power station in West Virginia being abandoned. This was despite a successful pilot scale capture facility being tested over a two year period. The abandonment has been put down to ‘congressional inaction on climate change’. The financed simply did not justify continued operation. Doubts were also raised on the long-term viability of CCS in Europe (16 January 2012) due to the cancellation of a number of high profile projects.

In the UK the mood has been typically sceptical. The Guardian (9 May 2012) asked the question ‘Whatever happened to carbon capture in the fight against climate change?’ and reported that CCS has been hobbled by the economic crisis, but even so Europe is far behind the US. However, a new Norwegian (Mongstad) plant provides hope that CCS may be viable. The Financial Times (6 October 2011) reported that there were cost fears for a UK carbon capture plan, only days before the Longannet Project was abandoned, sparking anger over the failure of the project (19 October 2011). The Guardian (14 May 2012) reported studies carried out off the coast of Scotland to simulate a CCS leak. The study reported that “… it’s unrealistic that we have any massive leaks, so I think what we’re looking at is leakage of CO2 from point sources, injected from a well or a pipeline.” http://www.co2geonet.com

Hardly reassuring comments for the public! The Daily Telegraph (11 February 2011) again raised fears surrounding CCS by posing the question: “Carbon capture: a flimsy plaster or the answer to climate change?” The tone of the article was such that it suggested that CCS was a short-term fix to a much bigger problem.
In Scotland, the Daily Record has widely covered CCS, however this is seen more of a socio-economic driver for the Scottish economy than any in-depth analysis of the pros and cons of CCS technology (18 May 2011). Much coverage has been focused on job creation in Scotland through the implementation of capture plants. However, once these plans were abandoned the paper then focused on ‘Whitehall bungles’ that ‘sank carbon capture’.

As an emerging economy, India is looking to all aspects of CCS and CCU to cope with their ever expanding energy needs. The Hindu (27 July 2011) reported that CCU could make economic sense, with the right investment. New classes of catalysts for the conversion of CO₂ into commercially important cyclic carbonates, which can be used as electrolytes for lithium ion batteries; additives for petrol, diesel and aviation fuel; solvents; and in the production of polycarbonates and polyurethanes, and other commercial chemical processes are being developed. This provides the economic drivers for capture implementation.

Conclusions

The publics are generally unaware of the technologies underpinning CCS, and even less so CCU. However, when seen as an environmental advantage they have reasonably levels of acceptance. When they are informed of the science and engineering behind the technologies they tend to become less trusting. When socio-economic benefits are highlighted acceptance again increases, particularly if there is a suggestion of job creation and security. The press play an important role in informing the publics about the role of CCS and CCU in society and the economy. However, the media are looking for high impact stories and on balance many tend to show the negative aspects of the technology.
3. Industry Comment

This was a valuable and much-needed meeting between representatives of business and industry and academics from the social sciences.

From technological advancement to political will, the future of Carbon Capture and Storage (CCS) technologies in the UK and beyond will be determined by a host of interlinked factors. Developing an understanding of public opinion towards the technology—both in general and for specific projects—stands to be one such factor; and we learnt at this workshop of the importance of appropriate and timely engagement with communities, so as to improve acceptance of the technology (although interestingly the story appears to be different in China).

While a number of themes emerged from presentations and subsequent discussion, one issue that was raised repeatedly was that of trust. It would appear that while public awareness of CCS and its applications remains low, the question of who people trust to provide them with information about the technology will have a bearing on how opinion develops. Indeed, for some people the messenger might prove to be as (if not more) important than the message!

Perhaps this issue could be light-heartedly conceptualised as a ‘Four David’ one. Are people more likely to trust David Cameron (politician); David Reiner (attitude expert); David Attenborough (respected media scientist); or David Beckham (popular celebrity) to provide them with information about CCS? In reality, of course, the issue is more complex than this; however, the point remains such that the future of CCS will hinge—at least to some extent—on what the general public think, and so understanding who people will listen to and trust when forming their opinions will be an important consideration.

Moving forward, it is clear that there is an integral role for the social sciences in both understanding and shaping the future of CCS in the UK and further afield. This workshop was timely and, for me, re-emphasised the importance of investing in collaborative R&D in order to help address the myriad issues faced by the UK on the road to a low-carbon future. The successes in addressing the successive clean-up of power generation from its very dirty beginnings that have emanated from a strong academic/industrial partnership bode well for finding a pathway to a low carbon future. The challenge for this working group is to maintain the momentum from this workshop, so that the issues of communication and public engagement remain at the forefront of the agenda.

Prof. Allan Jones FEI, FInstP, FREng
4. Feedback Summary

The meeting generated a lot of discussion between the attendees and speakers, and many questions were asked, not all of which could be answered.

Those present agreed that it was vital that the right messages about CCS are communicated to the general public. The rationale for CCS should go right back to presenting the science behind climate change itself, and CO₂’s involvement in this process.

Delegates felt that lessons could be learned from communicating other contentious science issues and that it was important not to confuse the public. The example of the nuclear industry was particularly interesting because it showed how attitudes and opinions to new technology could change over time due to secrecy or poor communication on the part of the scientists involved, or due to actual bad practice and accidents. It is vital that information concerning CCS is made available to the public by a respected, independent voice. Equally important is the acknowledgment of uncertainty and differences in expert opinion, which are a normal, healthy part of the scientific process.

However, there was some disagreement regarding how the public should be involved in discussions and whether this was actually necessary at all in some situations. For example, since onshore storage of CO₂ in the UK is unlikely to occur due to the capacity and proximity of offshore storage potential in the North Sea, does the general public need consultation about this at all? Some delegates argued that it was still important to address this issue to prevent misunderstanding and suspicion.

Most delegates agreed that there is a need for communication about CCS from industry at an early stage. However, many acknowledged that industry may not be best placed to do this itself. Mistrust of government and the EU is also consistently reported as being high in Eurobarometer surveys of CCS, and the most respected sources of information are seen as universities, ‘green’ organisations, and independent research institutions.

Different styles of public engagement were also discussed during this event, with video based engagement suggested, as well as involving more psychologists who could possibly use methods akin to ‘clinical trials’ to pinpoint the best messages to communicate about CCS in certain contexts.

Antony Benham, NCCCS
5. References


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7. Key contacts

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